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| 10/576,311 | 04/18/2006 | Paul Mattheijssen | NL 031254 | 9412 |
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| NXP, B.V. NXP INTELLECTUAL PROPERTY DEPARTMENT M/S41-SJ 1109 MCKAY DRIVE SAN JOSE, CA 95131 | | | MUL GARY | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

Office Action Summary

Application No.

10/576,311

Applicant(s)

MATTHEIJSEN ET AL.

Examiner

GARY MUI

Art Unit

2416

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 April 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1 – 18 have been considered but are moot in view of the new ground(s) of rejection.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

3. Figures 1 – 4 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. In addition to Replacement Sheets containing the corrected drawing figure(s), applicant is required to submit a marked-up copy of each Replacement Sheet including annotations indicating the changes made to the previous version. The marked-up copy must be clearly labeled as "Annotated Sheets" and must be presented in the amendment or remarks section that

explains the change(s) to the drawings. See 37 CFR 1.121(d)(1). Failure to timely submit the proposed drawing and marked-up copy will result in the abandonment of the application.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 are rejected under 35 U.S.C. 102(b) as being anticipated by Calderbank et al. (US 6,115,427; hereinafter “Calderbank”).

For claim 1, Calderbank teaches a transmitter for simultaneously transmitting at least a first and a second signals (see column 5 lines 8 – 9; signals are transmitted simultaneously), the first signal being modulated according to a first modulation constellation (see column 5 line 46 – column 6 line 9 and figure 3; first code sequence goes to constellation mapper and will be modulated), the second signal being modulated according to a second modulation constellation (see column 5 line 46 – column 6 line 9 and figure 3; second code sequence goes to constellation mapper and will be modulated), wherein the transmitter is arranged to pre-code at least the first signal through a modification of the first modulation constellation so as to prevent a correlation between the at least first and second simultaneously transmitted signal (see column 5 line 46 – column 6 line 9 and figure 3; signal is sent through a constellation mapper and will allow for a reduce effects of multi-path distortion fading).

For claim 2, Calderbank teaches the pre-coding of at least the first signal comprises a rotation of the first modulation constellation through a first angle (see column 5 line 46 – column 6 line 9 and figure 3).

For claim 7, Calderbank teaches the first and second modulation constellations are M-ary QAM modulation constellations (see column 4 lines 50 – 65).

For claim 8, Calderbank teaches a receiver for simultaneously receiving at least a first and a second signal from a transmitter (see column 9 lines 1 – 7; receiver receiving the signals), the first received signal being modulated according to a first modulation constellation (see column 5 line 46 – column 6 line 9 and figure 3; first code sequence goes to constellation mapper and will be modulated), the second received signal being modulated according to a second modulation constellation see column 5 line 46 – column 6 line 9 and figure 3; second code sequence goes to constellation mapper and will be modulated), in which at least the first received signal is pre-coded through a modification of the first modulation constellation so as to prevent a correlation between the at least first and second simultaneously received signals (see column 5 line 46 – column 6 line 9 and figure 3; signal is sent through a constellation mapper and will allow for a reduce effects of multi-path distortion fading).

For claim 9, Calderbank teaches the pre-coding of the first received signal comprises a rotation of the first modulation constellation (see column 5 line 46 – column 6 line 9 and figure 3).

For claim 14, Calderbank teaches the first and second modulation constellations are M-ary QAM modulation constellations (see column 4 lines 50 – 65).

For claim 17, Calderbank teaches a wireless device (see column 6 lines 28 – 38) comprising a transmitter according to claim 1 (see above for transmitter for claim 1).

For claim 18, Calderbank teaches a telecommunication system (see column 2 lines 25 – 27) comprising a transmitter according to claim 1 (see above for transmitter for claim 1).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 3 – 5 and 10 – 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calderbank in view of Cudak et al. (US 2005/0289256 A1; hereinafter “Cudak”)

For claim 3, Calderbank teaches all of the claimed subject matter with the exception of the pre-coding of at least the first signal comprises a change of the order of the first modulation constellation. However, Cudak teaches the pre-coding of at least the first signal comprises a change of the order of the first modulation constellation (Cudak, paragraph [0019], lines 7-13, teaches that the modulation scheme for a data stream is changed to match the signal quality. Specifically, a higher modulation order is used when the signal quality is high, and a lower modulation order is used when the signal quality decreases. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the pre-coding of at least the first signal comprises a change of the order of the first modulation constellation of Cudak into Calderbank. The motivation for doing this is to adapt the system to the channel quality for efficient use of the transmission channel in the analogous art of wireless communications as suggested by Cudak.

For claim 4, Calderbank teaches the pre-coding further comprising a change of the number of the number of simultaneously transmitted signals (see column 2 lines 18 – 30).

For claim 5, Calderbank teaches all of the claimed subject matter with the exception of the transmitter is arranged to pre-code at least the first signal after receipt of a first signal from a receiver of the at least first and second simultaneously transmitted signals. However Cudak teaches the transmitter is arranged to pre-code at least the first signal after receipt of a first

signal from a receiver of the at least first and second simultaneously transmitted signals (Cudak, figure 4, step 405 teaches that the base station receives a channel quality report message from remote units before determining an appropriate modulation and coding scheme for the transmitted signal in step 409.) Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the transmitter is arranged to pre-code at least the first signal after receipt of a first signal from a receiver of the at least first and second simultaneously transmitted signals of Cudak into Calderbank. The motivation for doing this is to adapt the system correctly to the channel conditions for more efficient operation in the analogous art of wireless communications.

For claim 10, Calderbank teaches all of the claimed subject matter with the exception the pre-coding of at least the first received signal comprises a change of the order of the first modulation constellation. However, Cudak teaches the pre-coding of at least the first received signal comprises a change of the order of the first modulation constellation (Cudak, paragraph [0019], lines 7-13, teaches that the modulation scheme for a data stream is changed to match the signal quality. Specifically, a higher modulation order is used when the signal quality is high, and a lower modulation order is used when the signal quality decreases.) Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the pre-coding of at least the first received signal comprises a change of the order of the first modulation constellation of Cudak into Calderbank. The motivation for doing this is to adapt the system to the channel quality for efficient use of the transmission channel in the analogous art of wireless communications.

For claim 11, Calderbank teaches the pre-coding further comprising a change of the number of the number of simultaneously received signals (see column 2 lines 18 – 30).

For claim 12, Calderbank teaches all of the claimed subject matter with the exception the receiver is arranged to transmit a first signal to the transmitter in a response to which the transmitter is arranged to pre-code at least the first signal. However Cudak teaches the receiver is arranged to transmit a first signal to the transmitter in a response to which the transmitter is arranged to pre-code at least the first signal (Cudak, figure 4, step 405 teaches that the base station receives a channel quality report message from remote units before determining an appropriate modulation and coding scheme for the transmitted signal in step 409.) Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the receiver is arranged to transmit a first signal to the transmitter in a response to which the transmitter is arranged to pre-code at least the first signal of Cudak into Calderbank. The motivation for doing this is to adapt the system to the channel quality for efficient use of the transmission channel in the analogous art of wireless communications.

Claim Rejections - 35 USC § 103

11. Claims 6 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calderbank in view of Kwan et al. (US 2003/0081692 A1; hereinafter “Kwan”).

For claim 6, Calderbank teaches all of the claimed subject matter with the exception the transmitter is arranged to transmit a second signal to a receiver of the at least first and second signals in order to notify the receiver about the pre-coding of at least the first signal. However

Kwan teaches the transmitter is arranged to transmit a second signal to a receiver of the at least first and second signals in order to notify the receiver about the pre-coding of at least the first signal (Kwan, abstract, teaches that the optimized modulation and coding scheme (MCS) is communicated from a transmitter to a receiver in a wireless communications system.) Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the transmitter is arranged to transmit a second signal to a receiver of the at least first and second signals in order to notify the receiver about the pre-coding of at least the first signal of Kwan into Calderbank. The motivation for doing this is to notifying the modulation change to the receiver such as to prepare the receiver for the new modulation scheme for more efficient operation in the analogous art of wireless communications.

For claim 13, Calderbank teaches all of the claimed subject matter with the exception the receiver is arranged to receive a second signal from the transmitter in a response to the transmitter pre-coding at least the first signal. However Kwan teaches the receiver is arranged to receive a second signal from the transmitter in a response to the transmitter pre-coding at least the first signal (Kwan, abstract, teaches that the optimized modulation and coding scheme (MCS) is communicated from a transmitter to a receiver in a wireless communications system.) Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the receiver is arranged to receive a second signal from the transmitter in a response to the transmitter pre-coding at least the first signal of Kwan into Calderbank. The motivation for doing this is to notifying the modulation change to the receiver such as to prepare the receiver for the new modulation scheme for more efficient operation in the analogous art of wireless communications.

Claim Rejections - 35 USC § 103

12. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calderbank in view of Currivan et al. (US 2005/0141460 A9; hereinafter “Currivan”).

For claim 15, Calderbank teaches all of the claimed subject matter with the exception a transceiver. However Currivan teaches a transceiver (Currivan, figure 7, teaches a transceiver which comprises a transmitter and a receiver). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a transceiver of Currivan into Calderbank. The motivation for doing this use of a transceiver which combines a transmitter and a receiver such as to build a typical node in a communication system (Currivan, figure 7 shows that a typical communication node is a transceiver) in the analogous art of telecommunications.

For claim 16, Calderbank teaches a receiver for simultaneously receiving at least a first and a second signal from a transmitter (see column 9 lines 1 – 7; receiver receiving the signals), the first received signal being modulated according to a first modulation constellation (see column 5 line 46 – column 6 line 9 and figure 3; first code sequence goes to constellation mapper and will be modulated), the second received signal being modulated according to a second modulation constellation see column 5 line 46 – column 6 line 9 and figure 3; second code sequence goes to constellation mapper and will be modulated), in which at least the first received signal is pre-coded through a modification of the first modulation constellation so as to prevent a correlation between the at least first and second simultaneously received signals (see column 5 line 46 – column 6 line 9 and figure 3; signal is sent through a constellation

mapper and will allow for a reduce effects of multi-path distortion fading). Calderbank teaches all of the claimed subject matter with the exception a transceiver. However Currivan teaches a transceiver (Currivan, figure 7, teaches a transceiver which comprises a transmitter and a receiver). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a transceiver of Currivan into Calderbank. The motivation for doing this use of a transceiver which combines a transmitter and a receiver such as to build a typical node in a communication system (Currivan, figure 7 shows that a typical communication node is a transceiver) in the analogous art of telecommunications.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Mody et al. (US 2002/0181509 A1), Sampath (US 2003/0043929 A1), and Shim et al. (US 2004/0264593 A1) are cited to show a mimo transmitter and receiver for low-scattering environments.

14. **Examiner's Note:** Examiner has cited particular paragraphs or columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to GARY MUI whose telephone number is (571)270-1420. The examiner can normally be reached on Mon. - Thurs. 9 - 3 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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04/01/2009